VIA ELECTRONIC FILING

REMARKS

The Office Action mailed on June 17, 2010, has been reviewed and the comments of the Examiner carefully considered. Claims 1, 2 and 4-12 are currently under consideration.

Claim Amendments

Claim 1 has been amended to more particularly point out the claimed invention. Support for the amendments may be found throughout the specification, and for example, pages 8-11, 13-16, 21 and 24-26 of the specification, in their entirety. Each of the amendments is addressed in greater detail below in response to the enablement and written description rejections. No new matter is believed to have been added by way of these amendments.

Rejection Under 35 U.S.C. § 112, Second Paragraph ("Indefiniteness")

Claims 1, 2, 4-6 and 8-12 were rejected as being indefinite for recitation of the term "body fluid". The Examiner alleges that it is not clear how a wound-specific bacterium may be detected in a body fluid. Applicants respectfully disagree, and submit that the claim is not indefinite as written, for the following reasons. Throughout the specification, and for example, in the paragraph extending from line 33 of page 11 to line 10 of page 34 of the specification, Applicants illustrate how the detection of a wound-specific bacterium can be carried out in a body fluid (e.g., pus produced from a wound infected by the bacterium). Accordingly, Applicants respectfully submit that the claims are not indefinite and request reconsideration and withdrawal of the rejection.

Rejection Under 35 U.S.C. § 112, First Paragraph ("Enablement")

Claims 1, 2 and 4-12 were rejected under 35 U.S.C. § 112, First Paragraph, as allegedly not being enabled for the full claimed scope. Applicants respectfully disagree and submit that the claims are enabled for the following reasons.

Applicants submit that the amended claims are indeed adequately enabled under the requirements of 35 U.S.C. § 112, first paragraph, and that the practice of the claimed invention does not require undue experimentation. Applicants address the specific Wands Factors raised by the Examiner, as follows:

The amount of guidance presented by the specification is more than adequate, considering the nature of the invention and the skill in the relevant art. The specification exemplifies peptide substrates useful for the claimed methods, and provides guidance as to the nature of the peptides substrates encompassed by the claim. For example, variants, homologs and fragments of claimed SEQ ID NOs: 1-5 that are functional variants are illustrated on pages 14-16 of the specification. The specification describes "functional variants" on page 16, and notes that "Functional variants can also contain substitution of amino acids similar to those in the α1 RSL domain that result in no change or an insignificant change in function. Alternatively, such substitutions may positively or negatively affect function to some degree." This definition of functional variants also references the preceding text on pages 14 and 15, which describes sequence, structural, and functional changes to the claimed peptide substrates, but requires that the activity of the resultant peptide has function similar to the function of SEQ ID NOs: 1-5. As described in the specification, this similarity may be identical activity, or may be lesser or greater activity than the parent molecule. In other words, the claimed functional variants encompass homologs and fragments of SEQ ID NOs: 1-5, provided that the resultant peptides have functions similar to the parent molecule. The specification therefore provides abundant guidance by setting forth how one of skill in the art can identify, characterize and use such functional variants.

Furthermore, numerous experimental examples are provided in the specification. The experimental examples provide additional support and guidance for the full scope of the claimed functional variants. By way of illustration, example 6 demonstrates that SEQ ID NO:5 is itself a functional variant of SEQ ID NO: 2. Specifically, SEQ ID NO:5 contains a recombinantly engineered poly histidine sequence at the amino terminal end of the peptide set forth in SEQ ID NO:2. The experimental results described in example 6 demonstrate that this functional variant of SEQ ID NO:2 has virtually the same function and activity as the parent molecule, SEQ ID NO:2. Accordingly, in contrast to what is alleged in the Office Action, the as-filed specification provides examples of derivatives of the claimed peptides, provides a basis and rationale for the production of derivatives, provides a functional characterization of the derivatives, and provides evidence that derivatives designed according to the directions of the specification are indeed active and are functional variants of the claimed peptides.

The specification and experimental examples also enable the scope of the claims related to the peptide substrate being coupled to a support and to at least one detectable moiety. Pages 9-12 of the as-filed specification provide abundant guidance as to the methods, compositions, and decision-making process for selecting and using detectable moieties with the peptides of the invention. Example 3 describes how to use variants of the alpha-1 peptides of the invention to make detectable molecules according to the claims. Example 6 illustrates how to make a histidine-tagged variant of a peptide of the invention, and then how to use that variant in a detectable assay. Example 7 demonstrates the stability of detectably labeled peptides. These are among other examples of the enabling support found throughout the specification.

The previously-submitted declaration of Dr. Mitchell C. Sanders provides corroboration for the claimed methods. As noted by the Examiner previously, the declaration sets forth that the claimed methods encompass peptides associated with a support and with at least one detectable moiety. While the declaration may exemplify particular embodiments of the invention, the declaration supports the full scope of the currently-pending claims. That is, the declaration provides full support for use of the peptides set forth in the claim, wherein the peptide substrates are coupled to both a support and to at least one detectable moiety.

The declaration supports the full scope of the pending claims by way of several statements, including evidence presented regarding the inventive concept related to selectivity of the peptide substrates of the invention for bacterial enzymes by virtue of the steric constraints placed upon the cleavage site of the peptide substrate by the association of the peptide substrate with both the support and the detectable moiety. In fact, the declaration exemplifies this general concept of the presently-claimed invention, whereby peptide substrates of the invention are selectively acted upon by bacterial peptidases instead of mammalian peptidases. Furthermore, as set forth in the declaration, the fact that mammalian peptidases are present in wounds at much lower concentrations than the bacterial peptidases secreted into the same wounds by the infecting bacteria.

The Office Action also alleges that insufficient experimental examples are presented. Applicants respectfully disagree. It is well-established in the patent laws that whether several, a few, one, or no working examples are provided, it is of no consequence and does not alter the fact that the invention is enabled when abundant evidence of enablement – such as that illustrated herein – is provided. In addition to the detailed experimental examples set forth in the

present specification, the specification provides abundant detail for various embodiments of the invention, and provides guidance to the skilled artisan to use any such method or combinations of methods encompassed by the full scope of the claims.

Furthermore, Applicants respectfully remind the Examiner that it is well-settled that the invention need not even contain a single example if the invention is otherwise disclosed in such manner that one skilled in the art will be able to practice it without an undue amount of experimentation (*In re Borkowski*, 422 F.2d at 908), and "representative samples are not required by the statute and are not an end in themselves" (*In re Robins*, 429 F.2d 452, 456-57, 166 USPQ 552, 555 (CCPA 1970)). Applicants further direct the Examiner's attention to MPEP § 2164.02, which states in relevant part:

> Compliance with the enablement requirement of 35 U.S.C. § 112, first paragraph, does not turn on whether an example is disclosed. An example may be "working" or "prophetic." A working example is based on work actually performed. A prophetic example describes an embodiment of the invention based on predicted results rather than work actually conducted or results actually achieved.

Thus, either a working example or a prophetic example would satisfy the enablement requirement under 35 U.S.C § 112, first paragraph. The skilled artisan can take the disclosed actual and prophetic examples of the present invention, which provide abundant description of methods of preparing and using the selective peptide substrates, for example, to readily practice the claimed invention. When applying the knowledge of one of skill in the art, in combination with the disclosure of the specification, the claimed invention is fully enabled within the scope of the claims.

The state of the prior art is such that the skilled artisan could take the disclosed examples and description of the present invention to readily practice the claimed invention. As amended, the claims more specifically point out the claimed invention. The amended claims do not require "undue experimentation," as the term is defined under the patent laws. The test of enablement is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue. See MPEP §2164.01 (citing *In re Angstadt*, 537 F.2d 498, 504 (C.C.P.A. 1976)). The test is not merely quantitative, since a considerable amount of experimentation is permissible if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. See *In re Wands*

(CAFC) 8 USPQ2d 1400, at 1404. The fact that experimentation may be complex does not necessarily make it undue if the art typically engages in such experimentation. Id. Further, the specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public. MPEP §2164.05(a) (citing *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991).

The skilled artisan, when armed with the abundantly enabled disclosure of the present patent application, would have to conduct no more than the reasonable amount of experimentation which is typical for the art of wound infection characterization. The techniques and materials required to conduct the methods of the claimed invention are well-known in the art. The claims, in conjunction with the specification, provide abundant guidance to the skilled artisan.

Accordingly, for the instant claims, both prongs of reasonableness of required experimentation, set forth in *In re Wands*, are satisfied. That is, the required experimentation is routine in the art, and the specification provides the guidance with respect to the direction in which the experimentation should proceed for the amended claims. Therefore, Applicants respectfully submit that the rejection has been overcome and request reconsideration and withdrawal of the rejection.

Rejections under 35 U.S.C. § 112, First Paragraph ("Written Description")

Claims 1, 2 and 4-12 were rejected as allegedly lacking written description. Applicants' understanding of the Written Description rejection is that the rejection appears to be an assertion that the specification allegedly does not provide adequate written description for the full claimed scope of peptide substrates. Applicants respectfully disagree with the Written Description rejection set forth in the office action, and submit that the claims comply with 35 U.S.C. § 112, First Paragraph, for the following reasons.

Regarding the scope of the peptide substrates, Applicants submit that the arguments and response to the enablement rejection above apply with equal force in response to the Examiner's Written Description rejection. That is, Applicants have provided examples of variants, homologs and fragments that are functional variants of peptides set forth in the claims. MPEP 2163 provides that "An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures,

diagrams, and formulas that fully set forth the claimed invention." Citing *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). Furthermore, this section of the MPEP provides that "To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention." Citing *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319, 66 USPQ2d 1429, 1438 (Fed. Cir. 2003); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ2d at 1116". Applicants submit that the combination of explicit disclosure, experimental examples, prophetic examples, and correlation of functional properties with the claimed peptide substrates indeed satisfies the written description requirement within the metes and bounds of the prevailing law.

Accordingly, because all of the currently pending claims are supported by the required Written Description, Applicants respectfully request that the rejections be reconsidered and withdrawn.

Conclusion

Applicants respectfully submit that the claims are in condition for allowance. An early Notice of Allowance is therefore earnestly solicited. Applicants invite the Examiner to contact the undersigned at (215) 963-5809 to clarify any unresolved issues raised by this response.

The Director is hereby authorized to charge/credit Deposit Account No. **50-0310** (Billing No. 101713-5093) for any other required fees, deficiencies or overpayments in connection with this Response.

Respectfully submitted,

SHITE SEBASTIAN ET AL.

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